REMARKS

As an initial matter, Applicants respectfully request consideration of the references cited in the attached "RESUBMISSION OF SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT". In paper No. 5, the Examiner drew a line through U.S. Pat. No. 5,421,893 to Perlov and Japanese references 8-186081, 10-92913, 9-219369, and 10-270436. The legal basis for this lack of consideration is not understood. These references were cited in the International Preliminary Examiner Report (IPER) dated November 28, 2000, and were provided to the Examiner. Each reference was either in the English-language (i.e., U.S. Pat. No. 5,421,893) or contained an English-language abstract and a concise indication of relevance, as provided by the IPER. Thus, the prerequisites for consideration of the submitted references (i.e., 37 C.F.R. § 1.97) were satisfied and the Examiner is requested to expressly consider such previously submitted references by reviewing and appropriately initialing the enclosed PTO-1449 form, which is resubmitted only for the Examiner's convenience.

THE 35 U.S.C. § 112, SECOND PARAGRAPH REJECTION

Claims 1-11 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Namely, it was alleged that the terms "depressions" and "depression" were "non-idiomatic, vague and indefinite because a depression is defined as having a central part lower than the margin". The Examiner contends, therefore, that "depressions" or "depression" do not describe elements 32 of Applicant's Figs. 5-7.

Applicants traverse this aspect of the rejection. Definiteness of claim language must be analyzed in light of the content of the application disclosure, the teachings of the

prior art, and the claim interpretation that would be given by one of ordinary skill in the art at the time the invention was made.

The essential inquiry is whether the claims set out and circumscribe a particular subject matter with a *reasonable* degree of clarity. Whether more suitable language or modes of expression are available in not the requisite test. The issue is legal - not grammatical. Applicants disclosure sets forth, in detail, the concept underlying the claimed depressions, describing and illustrated as one example depressions 32 "formed in the lower surface of the susceptor 22 at the position where the upper end of each protrusion 30 abuts in order to receive the protrusion 30 and limit the movement of the susceptor support shaft 24." (page 10, lines 10-15). The specification continues to state that "though it is not particularly necessary to specify the depth of the depression 32 since it will be sufficient if the depression 32 can limit the horizontal movement of the susceptor 22, the depth is preferably about half the thickness of the susceptor 22 as shown in Fig. 7 in order to securely prevent the protrusion from separating out of the depression 32." (page 10, lines 15-23). Thus, particularly in view of the functional description of the depression, those skilled in the art would understand the claimed depressions to comprise a depression of any shape or size sufficient to receive the protrusion and limit the movement of the susceptor support shaft. Contrary to the Examiner's assertion that "depression" has one fixed shape or meaning, the claimed depression may comprise any shape or manner of depression. Reconsideration and withdrawal of this aspect of the rejection is respectfully requested.

The specific aspects of the rejection advanced by the Examiner with respect to claims 3-6 are submitted to be overcome by the amendments to claims 3-6, respectively.

Accordingly, it is submitted that all of the pending claims comport with the requirements of 35 U.S.C. § 112, second paragraph. Withdrawal of this rejection is requested.

THE 35 U.S.C. § 102(B) REJECTION OVER BOWMAN

Claims 1-7 and 9-11 are rejected under 35 U.S.C. § 102(b) as being anticipated by **Bowman** (5,044,943). Reconsideration is requested.

Bowman is said to provide a semiconductor production apparatus including a process chamber; a wafer support disposed within said process chamber for supporting a semiconductor wafer; and a heating source for heat treatment of the semiconductor wafer supported by said wafer support. The wafer support is said to comprise a silicon carbide coated graphite (col. 3, lines 12-15) and a susceptor support shaft having a main shaft positioned substantially coaxial with a center of said susceptor and three arms having protrusions on a distal end radially extending from an upper end of the main shaft. These arms engage openings 24 on the lower side of **Bowman's** susceptor.

However, **Bowman** does not identically teach openings 24 extending in a radial direction of the susceptor, wherein a bottom portion of each of the openings extends along a direction substantially parallel to a plane defined by at least one of a top surface or a bottom surface of the susceptor so as to permit movement of the susceptor in a substantially radial direction relative to the protrusions along the openings 24. Instead, the openings are formed with a bottom portion that is arranged at an acute angle to the bottom surface of the susceptor and is thus not substantially parallel to a plane defined by the bottom surface of the susceptor. Accordingly, the apparatus of **Bowman** does not

permit movement of the susceptor in a substantially radial direction relative to the protrusions along the openings.

Since a claim is anticipated "only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference", it is respectfully submitted that **Bowman** does not anticipate claims 1-11 under 35 U.S.C. § 102(a). *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987). Reconsideration and withdrawal of this rejection is requested.

THE 35 U.S.C. § 103(A) REJECTION OVER BOWMAN

Claims 1-7 and 9-11 are rejected under 35 U.S.C. § 103(a) as being obvious over **Bowman**. Reconsideration is requested.

Further to the above remarks, Applicant respectfully submits that **Bowman** does not teach or suggest, *inter alia*, openings 24 extending in a radial direction of the susceptor, wherein a bottom portion of each of the openings extends along a direction substantially parallel to a plane defined by at least one of a top surface or a bottom surface of the susceptor so as to permit movement of the susceptor in a substantially radial direction relative to the protrusions along the openings 24. Instead, the openings 24 are formed with a bottom portions 24, 26, 28 that do not "extend along a direction substantially parallel to a plane defined by at least one of a top surface or a bottom surface of the susceptor", as claimed. The primary bottom surface, 28, is arranged at acute angle to the bottom surface of the susceptor, shown in Figure 2, ranging from about 45° to about 75° (col. 3, lines 23-25). This angle is said to provide "support for susceptor 20 at positions adjacent end edge 21 of susceptor 20" (col. 3, lines 25-27). Accordingly, the apparatus of **Bowman** is not configured to permit movement of the susceptor in a

substantially radial direction relative to the protrusions along the openings and would not have suggested such structure to one skilled in the art at the time of the invention.

The requisite motivation to support the ultimate legal conclusion of obviousness under 35 U.S.C. §103 is not an abstract concept, but must stem from the applied prior art as a whole and have realistically impelled one having ordinary skill in the art to modify a specific reference in a specific manner to arrive at a specifically-claimed invention. *In re Newell*, 891 F.2d 899, 13 USPQ2d 1248 (Fed. Cir. 1989). It is respectfully submitted that the Examiner's facially incorrect reasoning fails to discharge the judicial requirement for identifying a basis why one having ordinary skill in the art would have been realistically motivated to modify **Bowman** to arrive at the claimed invention. *In re Rouffet*, 149 F.3d 1350, 47 USPQ2d 1453 (Fed. Cir. 1998).

Although a prior art device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so." See *In re Fritch*, 972 F.2d 1260 (Fed. Cir. 1992). The Examiner must show reasons why a skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed. *In re Rouffet*, supra. The showing must be clear and particular. See, e.g., *In re Dembiczak*, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999); *C.R. Bard, Inc. v. M3 Sys., Inc.*, 157 F.3d 1340, 1352 (Fed. Cir. 1998).

Accordingly, it is submitted that the invention of claims 1-7 and 9-11 is not obvious under 35 U.S.C. § 103(a) in view of **Bowman**. Reconsideration and withdrawal of this rejection is requested.

THE 35 U.S.C. § 103(A) REJECTION OVER BOWMAN IN VIEW OF DEBOER ET AL.

Claim 8 is rejected under 35 U.S.C. § 103(a) as being obvious over **Bowman** in view of **deBoer et al.** (5,427,620). Reconsideration is requested.

The Examiner alleges **deBoer et al.** disclose a wafer support analogous to that of **Bowman** and teaches that it is desirable to construct the susceptor support shaft of a transparent material such as fused quartz. The Examiner alleges it would have been obvious to one skilled in the art to provide the apparatus of **Bowman** with the susceptor support shaft or main shaft comprising silica glass since **deBoer et al.** teach that this transparent material "allows radiant heat from the heat lamps to pass through and more evenly heat the susceptor".

However, **deBoer et al.** fail to make up for the deficiencies of **Bowman**. Namely, **deBoer et al.** also fail to teach or suggest openings extending in a radial direction of the susceptor, wherein a bottom portion of each of the openings extends along a direction substantially parallel to a plane defined by at least one of a top surface or a bottom surface of the susceptor so as to permit movement of the susceptor in a substantially radial direction relative to the protrusions along the openings. Instead, as shown in Figure 6, the susceptor is provided with three cylindrical holes appearing to correspond in size and shape to the upstanding pegs 47 (see, e.g., col. 6, lines 55-64).

Thus, the combination of **deBoer et al.** and **Bowman** fail to teach or suggest each and every element of claim 8, which depends from claim 1. Accordingly, it is submitted that the invention of claim 8 is not obvious under 35 U.S.C. § 103(a) in view of **deBoer et al.** or **Bowman**, taken singly or in combination. Reconsideration and withdrawal of this rejection is requested.

THE 35 U.S.C. § 103(A) REJECTION OVER DEBOER ET AL. IN VIEW OF BOWMAN

Claims 1-11 are rejected under 35 U.S.C. § 103(a) as being obvious over **deBoer et al.** in view of **Bowman**. Reconsideration is requested.

The Examiner notes that **deBoer et al.** provide susceptor support arms 46 having upstanding pegs 47 at a distal end and concludes that "it would have been obvious to one skilled in the art to modify the pegs 47 of **deBoer et al.** by providing them in at an angle in the manner taught by **Bowman** (Figs. 3A and 3B) for the distal ends of his arms." The Examiner proffers, as logical support for the rejection, that "**Bowman** teaches (see col. 3, lines 60-68) that an angled protruding end of a support arm, combined with an opening 24 that is angled to match the angle of the protrusion, with desirably facilitate mounting of the susceptor 20 on spokes 30 by a downward motion of susceptor 20 onto spokes, one of which is shown in Figs. 3A and 3B to illustrate this point.

As noted above, neither **deBoer et al.** nor **Bowman** teach or suggest openings extending in a radial direction of the susceptor, wherein a bottom portion of each of the openings extends along a direction substantially parallel to a plane defined by at least one of a top surface or a bottom surface of the susceptor so as to permit movement of the susceptor in a substantially radial direction relative to the protrusions along the openings.

Accordingly, each and every element of claims 1-11 is not taught or suggested by **deBoer et al.** or **Bowman**, singly or in combination, and withdrawal of this 35 U.S.C. § 103(a) rejection is requested for at least this reason.

Further, the Examiner's statements with respect to **deBoer et al.** and **Bowman** underscore the lack of motivation to combine the references. The Examiner premises his motivation to combine on **Bowman's** teaching (see col. 3, lines 60-68) that an angled

protruding end of a support arm, combined with an opening 24 that is angled to match the angle of the protrusion, would desirably facilitate mounting of the susceptor 20 on spokes 30 by a downward motion of susceptor 20 onto spokes (Figs. 3A and 3B). However, **deBoer et al.** clearly show that the upstanding pegs 47 permit "mounting of the susceptor 20 on spokes 30 by a downward motion of susceptor 20 onto spokes" (see Fig. 6). Thus, the proffered motivation is without merit, as one skilled in the art would not combine the references for the avowed purpose to arrive at the claimed invention.

Accordingly, it is submitted that there is no motivation to combine **deBoer et al.** with **Bowman** as alleged by the Examiner. Thus, it is submitted that a *prima facie* case of obviousness has not been established under 35 U.S.C. § 103(a) and withdrawal of this rejection is requested for at least this reason.

CLOSING REMARKS

As the Examiner was required, under C.F.R. § 1.104(c), to "cite the best references at his or her command" and since the Examiner was also obligated to reject each claim on all valid grounds available (see MPEP § 707.07(g)), it can only be concluded that the Examiner has already set forth the best rejections possible over the applied references.

Moreover, since the Examiner's first search should have covered the invention as described in the specification, as well as the invention claimed and the inventive concepts toward which the claims appear to be directed (see, e.g., MPEP § 904) consistent with the mandate to give the claims the broadest reasonable interpretation during prosecution and the mandate to avoid "piece-meal" prosecution to thereby enable Applicants with a full and fair hearing and to clearly develop any issues prior to appeal. *See, e.g., In re Morris*, 127 F.3d

1048 (Fed. Cir. 1997); MPEP § 706.07. Since the amendments herein clearly lie within the subject matter already disclosed to the Examiner within Applicant's original specification, these amendments do not raise new issues.

Accordingly, if the Examiner elects to introduce a new ground of rejection, it is submitted that such rejection would not be necessitated by the present amendments which are directed to inventive concepts clearly disclosed in the specification and, correspondingly, such rejection, if made, would not properly be made be final.

It is further submitted that new claims 12-20 are patentable over the applied references and combinations of references for the same reasons noted above. For example, the applied references do not teach, singly or in combination, a support shaft having a main shaft positioned coaxial with a center of the susceptor, and a plurality of arms radially extending from an upper end of the main shaft, each of the arms having a distal end provided with a protrusion extending upward, the protrusions correspondingly engaged in the associated depressions such that the protrusions can slide along the depressions only in a substantially radial direction of the susceptor.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned VERSION WITH MARKINGS TO SHOW CHANGES MADE.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this

paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

Please amend the claims as follows:

1. (Amended) A semiconductor production apparatus including a process chamber; a wafer support disposed within said process chamber for supporting a semiconductor wafer; and a heating source for heat treatment of the semiconductor wafer supported by said wafer support;

wherein said wafer support comprises a susceptor having an upper surface for mounting said semiconductor wafer thereon, and a susceptor support shaft for supporting said susceptor from thereunder; wherein said susceptor support shaft having a main shaft positioned substantially coaxial with a center of said susceptor, and at least three arms radially extending from an upper end of said main shaft, each said arm having a distal end provided with a protrusion directed toward said susceptor; [and] wherein a peripheral portion of a lower surface of said susceptor being formed with depressions, each said depression having an inside diameter substantially identical to an outside diameter of said protrusion, adapted to engage said protrusion, wherein each of said depressions extend in a radial direction of said susceptor, and wherein a bottom portion of each of said depressions extends along a direction substantially parallel to a plane defined by at least one of a top surface of said susceptor or a bottom surface of said susceptor so as to permit movement of said susceptor in a substantially radial direction relative to said protrusions along said depressions.

4. (Amended) A semiconductor production apparatus according to claim 3, wherein said [protrusion] protrusions are configured to engage [is engaged in] said [depression] depressions on [the outermost] outer peripheral [side] sides thereof at ambient temperature [when said susceptor has a coefficient of thermal expansion greater than that of said susceptor support shaft].

5. (Amended) A semiconductor production apparatus according to claim 1, wherein said susceptor comprises [carbon] graphite.

6. (Amended) A semiconductor production apparatus according to claim 1, wherein said susceptor comprises [carbon] graphite having a surface coated with silicon carbide.

11. (Amended) A semiconductor production apparatus according to claim 1, wherein said [arm inclines] arms incline upward as said [arm extend] arms extends radially outward.